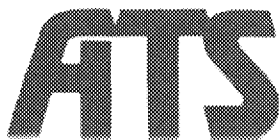


**USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA**

**REPORT ON
LEAK DETECTION AND REPAIR
OF EQUIPMENT IN BENZENE SERVICE
FOR THE PERIOD
JANUARY 1997 THROUGH JUNE 1997**

Prepared by:
Advanced Technology Systems, Inc.
3000 Tech Center Drive
Monroeville, Pennsylvania 15146-3055

OCTOBER 1997



ADVANCED TECHNOLOGY SYSTEMS, INC.

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1.0 INTRODUCTION

This report fulfills the requirements of the United States Code of Federal Regulations, Title 40, Part 61 (40 CFR 61), Subpart L (National Emission Standard for Benzene Emissions from Coke By-Product Recovery Plants) and Subpart V (National Emission Standard for Equipment Leaks [Fugitive Emissions Sources]). The required monitoring was conducted at the USS Clairton Works facility located in Clairton, Pennsylvania; this report summarizes the results for the period January through June 1997.

Equipment "in benzene service" is defined as that equipment which contains or contacts a fluid (liquid or gas) that is at least 10 percent benzene by weight or an exhauster that contains or contacts a fluid (liquid or gas) at least 1 percent benzene by weight. The following four streams at USS Clairton Works meet the requirements of this regulation:

- Raw gas is greater than 1 percent benzene by weight and is present in the axi compressors
- Sub gas is greater than 10 percent benzene by weight and contacts the main regenerators, sub gas vacuum machines, sub gas coolers, sub gas separators, and light oil regenerators
- Sub sub gas is greater than 10 percent benzene and contacts the light oil regenerators, sub sub gas coolers, and sub sub gas separators
- Light oil contains greater than 10 percent benzene by weight, and contacts all separators, coolers, decanters, and the light oil transfer line to Aristech Corporation for further processing. Light oil is also used to wash screens in the final coolers and to periodically wash both the main and light oil regenerators.

2.0 METHODOLOGIES

The exact record keeping requirements, leak detection monitoring requirements, and initial and subsequent semiannual reporting requirements pertaining to 40 CFR 61, Subparts J and V can be found in the Code of Federal Regulations. Specific aspects of these requirements as they apply to USS Clairton are described below.

2.1 Identification of Equipment in Benzene Service

The operation of the by-product processes requires continual process piping maintenance and may involve physical changes in the processes. As a result, the leak detection and repair program requires a continual review of the operations to ensure that all equipment in benzene service is recognized and properly monitored. Identification includes both tabular registration of information on the individual components and a special series of process flow diagrams as an aid in specifically locating each component.

2.2 Monitoring of Equipment in Benzene Service

Monitoring of equipment in benzene service was performed in accordance with EPA Reference Method 21, Determination of Volatile Organic Compound Leaks. This method describes the selection and calibration of monitoring equipment as well as procedures used in the actual monitoring.

A Photovac MicroFID Intrinsically Safe Organic Vapor Meter was used for monitoring. The unit is equipped with a flame ionization detector (FID). In March and June, a photo ionization detector (PID) was used for about half of the readings. A gas standard containing approximately 10,000 ppmv methane in nitrogen was used for instrument calibration for the FID (hexane for the PID). Other concentration standards were prepared by diluting the gas standard with known volumes of air. Three-point calibrations were conducted at the beginning of each day of monitoring and a one-point verification was conducted at the end of the monitoring day.

All accessible components were monitored on a monthly, quarterly, semiannual, or annual basis as required by the applicable subpart regulations (at the request of USS Clairton Works, the alternative monitoring plans described in these subparts are not followed). It should be noted that many major components, such as axi compressors, regenerators, and final coolers, are not in service at all times due to repairs and/or intermittent need, and the pumping of light oil to the barge loading dock is also intermittent. Monitoring of these components is conducted only if the equipment is in service at the

time of monitoring. In addition, the various light oil wash systems are in intermittent use, and likewise are only monitored if in service at the time of monitoring.

Depending on the particular piece of equipment monitored, a leak is defined, in general, as any emission which results in a monitored reading greater than or equal to either 500 ppmv or 10,000 ppmv (whichever is applicable), or any visible leak. Any leaking components must have the initial repair attempted within five days of the determination; final repairs must be completed within 15 days of the determination.

2.3 Annual Difficult-to-Monitor Monitoring Program

The 1997 annual Difficult-to-Monitor monitoring will be conducted during the last half of 1997, and reported during the next period. The 1996 monitoring was conducted on December 23, 1996, and inadvertently left out of the semiannual report for that period. The following is the report for 1996.

The 1996 annual monitoring program for equipment components classified as difficult-to-monitor (DTM) was monitored on December 23, 1996, according to the written plan contained in the plants' NESHAPS Program Manual. There is a total of 408 valves on the DTM list. Of these, 99 were monitored. The remaining 309 were not monitored for the following reasons:

- A total of 219 of these components were reclassified as Unsafe-to-Monitor. All but 18 of these are in the Axi Compressor rooms on high racks above the compressors. The plant has established that it is completely unsafe to monitor while in operation, and when not in operation, there is no flow. Visually, none of the components appear to have emissions. Of the other 18, 10 were blocked off in an area where asbestos was being removed; they will be monitored during the next DTM period.
- A total of 36 components were in wash systems which were not in operation.
- A total of 16 components have been reclassified to be included in the regular quarterly/monthly monitoring program.
- A total of 21 components were in operating units which were not in operation.

- A total of 17 components were in areas which could not be accessed for various reasons (flooding, etc.). Nine of them could not be located, and are probably no longer in the system.

2.4 Semi-Annual Gas-Blanketing System Inspection

The semiannual gas-blanketing system inspection for the period was conducted between May 29 and June 11, 1997. The program was conducted according to a written Gas-Blanketed Vessel Monitoring Plan. The full inspection combines both a monitoring of potential emission inspection points by Method 21, and a mechanical/chemical maintenance inspection of the same points.

The semiannual program included inspection of 58 gas-blanketed units, which utilizes an emergency pressure/suction relief seal pot arrangement, and 15 gas pressure and flow control stations contained in a series of seven gas loops. Clean coke oven gas is utilized as the blanketing medium. The 73 NESHAPS inspection units each contain multiple potential inspection points such as valves, vents, lid flange connectors, gasketed lid manways, etc. The inspection notes the number and definition of any defects located and observed.

The annual NESHAPS inspection will be conducted during the next semiannual period.

3.0 RESULTS

3.1 Equipment Component Leak Monitoring Results

Table 1 indicates the process equipment units in operation during each period of monitoring. Table 2 summarizes the number of components monitored and the number of the leaking components.

As shown in Table 2 for the period January 1997 through June 1997, seven components in benzene service were found to be leaking. This is equivalent to 0.16 percent leakers for the semiannual period, well within the regulatory criteria to permit the quarterly monitoring frequency as conducted.

Shown in Table 3 is the specific identification and repair history of the leaking components. All the leakers were repaired within the required period, and subsequent monitoring indicated successful repair.

3.2 Difficult-to-Monitor Monitoring Results

There were no leaking components found during the annual Difficult-to-Monitor monitoring program.

3.3 Gas-Blanketing System Inspection Results

Contained in the 73 NESHAPS units monitored in the gas-blanketing system are a total of 1968 potential inspection defect points. A total of 71 defects were recorded, or a 3.6% defect rate. Only 14 of these were actual emissions over the stipulated limit of 500 ppmv. Of the remainder, 44 were open ports in the tar decanter roofs which are not permissible per the regulations. The other 13 were assorted mechanical or chemical defects.

The open ports were all plugged, or otherwise covered, to meet the regulations. The assorted defects were repaired or cleaned. The emissions were reduced below 100 ppmv through a variety of mechanical repairs or alterations.

TABLE 1
USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

EQUIPMENT IN OPERATION DURING
NESHAPS MONITORING PERIODS
JANUARY THROUGH JUNE 1997 SUMMARY

CONTROL ROOM #1								
UNIT TYPE	USS ID #	NESHAPS FIG #	DATE					
			01/28/97	02/11/97	03/25/97	04/09/97	05/28/97	06/11/97
AXI COMPR.	C-100	1	on	on	repair	repair	on	on
	C-105	2	on	on	on	on	on	on
	C-110	3	on	on	on	on	on	on
	C-115	4	on	on	on	on	spare	spare
	C-120	5	spare	on	on	on	on	on
	C-125	6	on	on	on	on	on	on
	C-130	7	spare	repair	on	on	repair	repair
	C-135	8	on	repair	repair	repair	repair	on
	C-140	9	spare	on	on	on	on	on
	C-145	10	spare	repair	spare	spare	spare	spare
	C-150	11	on	on	on	on	on	on
	C-155	12	on	repair	spare	spare	on	spare
	C-160	13	on	on	on	on	on	on
	C-165	14	repair	repair	repair	repair	repair	repair
	C-170	15	on	on	spare	spare	on	on
	C-175	16	on	on	on	on	on	on
	C-180	17	repair	on	on	on	on	on
	C-185	18	on	on	on	on	on	on
SUPER STILL		21,22	on	on	on	on	on	on
FINAL COOLER	201	20	on	on	off	off	off	off
	202	20	on	on	on	on	on	on
	203	20	off	off	on	on	on	on
	206	20	off	off	off	off	off	off
CONTROL ROOM #2								
UNIT TYPE	USS ID #	NESHAPS FIG #	DATE					
			01/28/97	02/11/97	03/27/97	04/09/97	05/28/97	06/12/97
VACUUM MACHINE	C-500	23	on	on	on	on	on	spare
	C-502	24	on	on	on	on	on	on
	C-505	25	repair	on	on	spare	on	on
	C-509	26	spare	on	on	on	on	on
	C-512	27	on	on	on	on	spare	spare
	C-515	28	on	on	repair	on	on	on
	C-518	29	on	on	spare	spare	on	on
	C-521	30	on	repair	on	on	on	on
	C-524	31	on	on	repair	on	on	on
	C-527	32	on	on	on	spare	on	on
	C-530	33	on	on	on	on	spare	spare
	C-533	34	spare	spare	on	on	repair	on
	C-536	35	repair	repair	repair	repair	repair	repair
	C-539	36	on	on	on	on	on	on
	C-542	37	spare	spare	repair	on	on	on
	C-545	38	on	on	on	repair	on	on
	C-548	39	repair	repair	on	on	spare	spare
LO REGEN.	R-582	53	on	on	on	on	on	on
	R-584	54	on	on	on	on	on	on
	R-586	55	on	on	on	on	on	off
	R-590	56	on	on	on	on	on	on
QUADS	1	40	on	on	on	off	on	on
	2	41	on	on	on	on	on	on
	3	42	on	on	on	on	on	on
	4	43	on	on	off	on	on	on
	5	44	on	on	on	on	on	on
	6	45	off	on	on	on	on	on
	7	46	off	off	on	on	off	off

TABLE 2
USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

NESHAPS MONITORING OF COMPONENTS IN BENZENE SERVICE
JANUARY THROUGH JUNE 1997 SUMMARY OF LEAKERS

MONITORING DATES		01/28/97	02/11/97	03/25,27,31 04/09/97	04/09/97	05/28,29/97	06/11,12/97
TOTAL COMPONENTS MONITORED VALVES (1)	COMPONENTS MONITORED	95	116	2043	95	176	1831
	LEAKS DETECTED	95	116	2033	95	172	1821
	PERCENT LEAKERS	1	1	4	0	1	0
	COMP. NOT REPAIRED			0.26			0.05
PUMPS	COMP. NOT REPAIRED	0	0	0	0	0	0
	COMP. ON REPAIRABLE	0	0	0	0	0	0
	COMPONENTS MONITORED	0	0	10	0	4	10
	LEAKS DETECTED	0	0	0	0	0	0
CONNECTORS	PERCENT LEAKERS	0	0	0	0	0	0
	COMP. NOT REPAIRED	0	0	0	0	0	0
	COMP. ON REPAIRABLE	0	0	0	0	0	0
	COMPONENTS MONITORED	0	0	0	0	0	0
	LEAKS DETECTED	0	0	0	0	0	0
	PERCENT LEAKERS	0	0	0	0	0	0
	COMP. NOT REPAIRED	0	0	0	0	0	0
	COMP. ON REPAIRABLE	0	0	0	0	0	0

(1) BASIC MONITORING IS QUARTERLY. PERCENT LEAKER CRITERIA IS ON A QUARTERLY BASIS, NUMBER SHOWN IS FOR ENTIRE CALENDAR QUARTER.

TABLE 3
USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

NESHAPS MONITORING OF COMPONENTS IN BENZENE SERVICE
JANUARY THROUGH JUNE 1997
LEAKER IDENTIFICATION AND REPAIR

MONITORING DATES	01/28/97	02/11/97	03/25/97	03/27/97	03/27/97	03/31/97	05/28/97
CONTROL ROOM NUMBER	1	2	2	2	2	2	1
TYPE COMPONENT	Valve	Valve	Valve	Valve	Valve	Valve	Valve
ATS IDENTIFICATION		7141		6202	7350	6923	
USS IDENTIFICATION	T201	D602	T203	D575	D604	R590	T203
NAME OF COMPONENT	Demister	Flow Control	Flow Control	Flow Control	Relief	Wash	Demister
ORIGINAL MONITOR DATE	01/28/97	02/11/97	03/25/97	03/27/97	03/27/97	03/31/97	05/28/97
ORIGINAL READING, PPMV	>10,000	>10,000	>10,000	>10,000	>10,000	>10,000	>10,000
REPAIR DATE	1/30	2/14	3/31	3/31	3/31	4/7	6/12
REPAIR MONITORING DATE	2/7	2/20	3/31	3/31	3/31	4/9	6/12
REPAIR READING, PPMV	72	25	0	250	1000	22	200
SECOND MONITOR DATE	3/25	3/31	4/9	4/9	4/9	5/28	
SECOND READING, PPMV	5	250	290	25	525	10	
THIRD MONITOR DATE	4/9	4/9	5/28	5/28	5/28	6/12	
THIRD READING, PPMV	10	40	>10,000	575	20	10	

